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Thayer County Test Hole Logs

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THAYER COUNTY Test-Hole Logs

Raymond R. Burchett and Frank A. Smith

**Nebraska Water Survey
Test-Hole Report No. 85**

**Conservation and Survey Division
Institute of Agriculture and Natural Resources
University of Nebraska-Lincoln**



**April, 1990
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The division is authorized to enter into agreements with federal agencies to engage in cooperative surveys and investigations in the state. Publications of the division and the cooperating agencies are available from the Conservation and Survey Division, University of Nebraska, Lincoln, Nebraska 68588-0517.

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Publication and price lists are furnished upon request.

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INTRODUCTION

In 1930, the Conservation and Survey Division of the University of Nebraska and the U.S. Geological Survey began a program of cooperative groundwater studies in Nebraska. Since then test drilling by use of rotary drilling equipment has been an integral part of that program. This report contains logs of all the test holes drilled in the county under the program as well as those drilled by the Conservation and Survey Division with financial assistance from other government agencies.

The map in this report shows the location of all test holes drilled in the county since 1930.

Present techniques of test-hole logging and sampling include use of drilling mud suitable to drilling conditions, timing by stopwatch of the drilling of each 5-foot increment of depth, and removal of all cuttings from the test hole at intervals of 5 feet or less. During the drilling of the hole, cuttings from each interval are examined immediately; samples representing each 5-foot interval and each recognizable change in material are retained. After samples are washed, they are described lithologically and the color is evaluated by comparison with standard color charts. The samples then are dried, stored, and cataloged. Beginning in September 1951, the test holes have been logged electrically. All samples are processed and kept on open file in the offices of Conservation and Survey Division, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588.

This publication is one of a series being issued to make more readily available the record of test holes drilled since 1930. The series of publications is made on a county basis and includes, with some exceptions, logs of all test holes drilled in each of the counties. The logs have not been reviewed for conformance with editorial standards and nomenclature.

The method whereby the altitude of the land surface at testhole sites was determined is indicated in the heading of each log, as follows: a = altimeter, h = hand leveling, i = spirit leveling, t = estimated from topographic map.

The test-hole records accurately reflect subsurface conditions only at the locations where the test holes were drilled. Interpretive data reflecting probable subsurface conditions between test-holes are being compiled for publication in county reports and are available for inspection in the office of the Conservation and Survey Division.

Each test hole is identified by a number assigned in the field (for example #3-B-67, #41-79), and most are also identified by a number indicating its location within the land divisions of the U.S. Bureau of Land Management's survey of Nebraska. Location numbers of test holes east of the 6th principal meridian, which passes through Columbus in a north-south direction, are preceded by the capital letter A; those west of the principal meridian have no preceding letter. The first numeral indicates the township, the second the range, and the third the section. As shown in figure 1, the letters that follow the section number indicate the location of the test hole within the section, the first letter indicating the quarter section and the second letter indicating the quarter-quarter section. The letters A, B, C, and D are applied in counterclockwise direction beginning with A in the northeast quadrant. The last numeral is the serial number of the test hole within the quarter-quarter section. No number is shown unless more than one test hole is within the given quarter-quarter section.

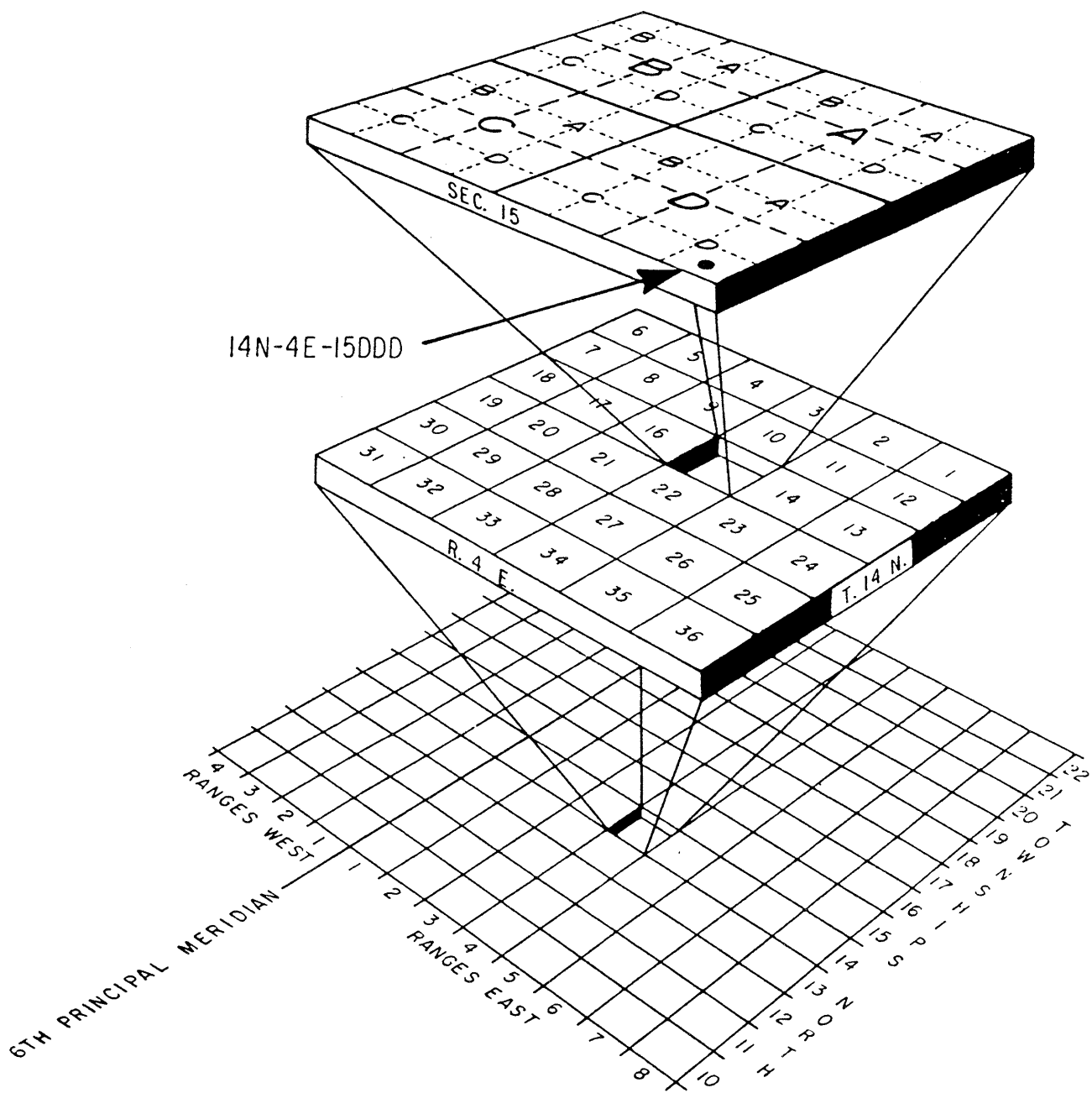
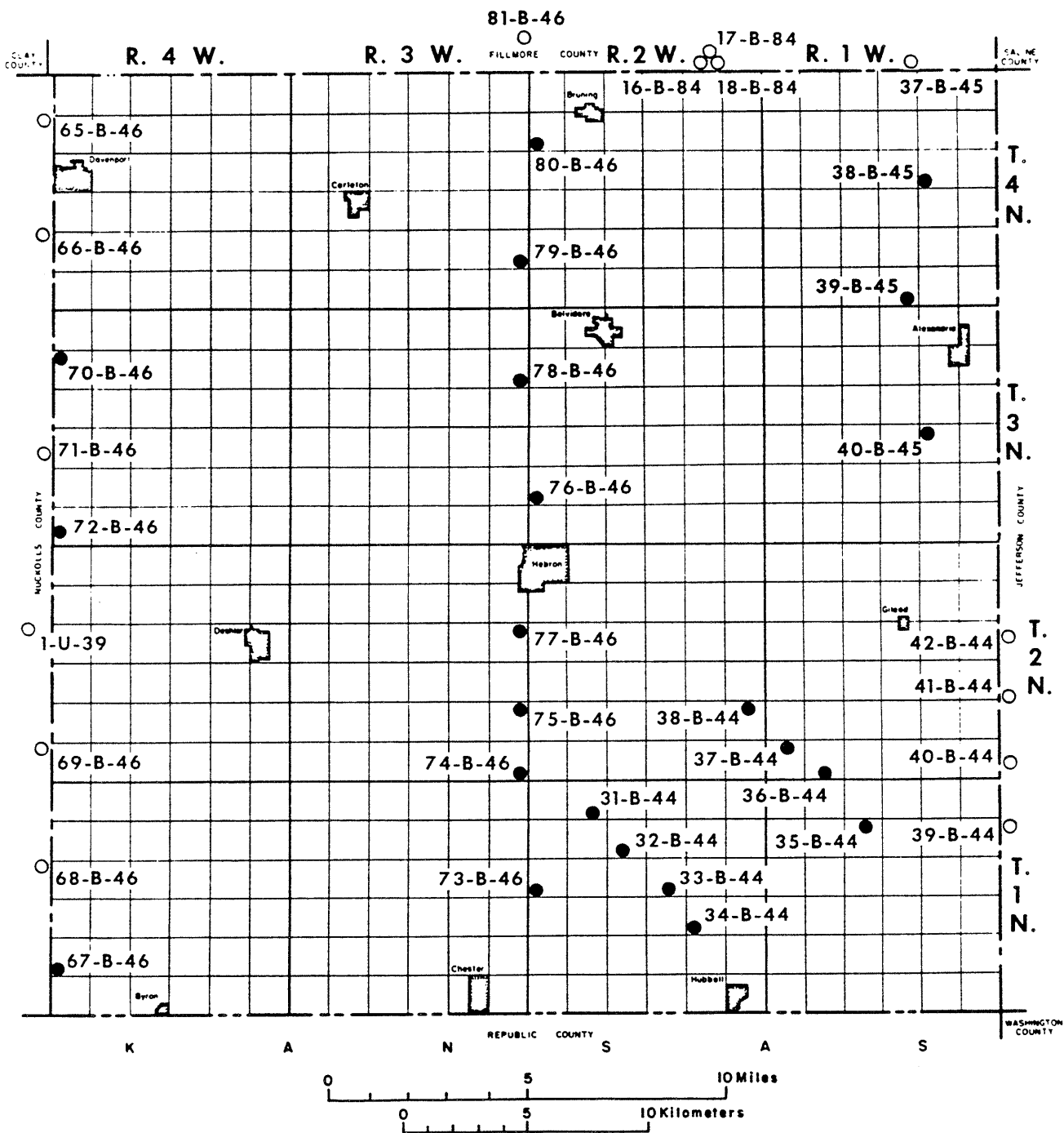


Fig. 1. System for identifying test-holes according to their location.

Thayer County
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- Test hole description published in this report
- Test hole description published in other report



Fig. 2. Test-hole location map of Thayer County.

Test Hole #35-B-44
(1-1-9ba)
Thayer County

Location: NE corner NW sec. 9, T. 1 N., R. 1 W., approximately
 4 feet south and 2,636 feet east of northwest corner.

Ground elevation: 1,466.0 ft. (t) (Hubbell 7.5 min. quadrangle)

Depth to water: 43.7 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, grayish tan.....	0.0	2.5
Clay, silty, light reddish brown.....	2.5	23.0
Sand and gravel, texture grades from medium sand to coarse gravel, principally green at 45.0 ft.....	23.0	59.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Clay shale, gray, limonitic from 60.0 to 77.0 ft....	59.5	77.0
Shale, reddish brown.....	77.0	78.0
Shale, dark gray, contains black carbonaceous particles.....	78.0	90.0

**Test Hole #31-B-44
(1-2-5dc)
Thayer County**

Location: SW corner SE sec. 5, T. 1 N., R. 2 W., approximately
6 feet north and 2,605 feet west of southeast corner.
Ground elevation: 1,553.0 ft. (t) (Chester 7.5 min. quadrangle)
Depth to water: 81.4 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, dark gray to black.....	0.0	4.0
Clay, silty, tannish gray.....	4.0	10.0
Clay, silty, pinkish tan, granular, contains some fine sand from 45.0 to 50.0 ft.....	10.0	50.0
Sand, silty, gray, very fine texture sand, slightly coarser from 58.0 to 64.0 ft.....	50.0	64.0
Sand and gravel, texture grades from medium sand to fine gravel, contains many feldspars.....	64.0	76.0
Clay, silty, moderately calcareous, tan.....	76.0	80.0
Silt, very calcareous, tan to buff, contains some limestone fragments.....	80.0	91.0
Silt, reddish brown.....	91.0	96.5
Silt, moderately calcareous, light gray, contains limy zones from 100.0 to 107.0 ft.....	96.5	107.0
Sand and gravel, texture grades from coarse sand to fine gravel, consists of quartz and some feldspar.	107.0	108.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn - Graneros Formations:		
Limestone and clay shale, interbedded, white, con- tains many shell fragments.....	108.5	111.5
Shale, dark gray to black, limonitic from 111.5 to 112.0 ft., limy zone from 112.0 to 113.0 ft., bentonitic from 119.5 to 120.0 ft.....	111.5	120.0

Test Hole #32-B-44
(1-2-9cd)
Thayer County

Location: SE corner SW sec. 9, T. 1 N., R. 2 W., approximately
 5 feet north and 2,609 feet east of southwest corner.

Ground elevation: 1,581.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: 75.5 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil, black.....	0.0	2.0
Clay, silty, reddish brown, granular from 2.0 to 2.5 ft., lighter with depth.....	2.0	15.0
Silt, tan to light brown, contains limy concre- tionary fragments from 35.0 to 75.0 ft.....	15.0	75.0
Silt, moderately calcareous, grayish tan, contains limy zone from 79.0 to 80.0 ft.....	75.0	85.0
Silt, contains some sand and much white limy material and intermittent hard zones.....	85.0	92.0
Sand and gravel, texture grades from medium sand to coarse gravel, principally gravel from 125.0 to 141.0 ft.....	92.0	141.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn - Graneros Formations:		
Shale, white.....	141.0	142.0
Shale, moderately calcareous, grayish black.....	142.0	145.0
Shale, moderately calcareous, grayish black, con- tains a thin hard limy zone at 147.5 ft.....	145.0	150.0

Test Hole #33-B-44
(1-2-15dc)
Thayer County

Location: SW SW SE sec. 15, T. 1 N., R. 2 W., approximately
 6 feet north and 2,521 feet west of southeast corner.

Ground elevation: 1,571.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: 108.4 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, dark gray to black.....	0.0	1.0
Clay, silty, tan.....	1.0	4.0
Clay, silty, dark red, granular in upper part.....	4.0	10.0
Silt, soil-like, dark reddish brown, granular.....	10.0	12.5
Silt, light reddish brown, lighter below 17.0 ft....	12.5	33.0
Silt, light pinkish gray.....	33.0	60.0
Silt, gray, contains limy fragments from 70.0 to 75.0 ft., contains sand below 75.0 ft.....	60.0	80.0
Sand, very calcareous, cemented.....	80.0	83.0
Sand, texture grades from medium to coarse, contains much feldspar.....	83.0	89.0
Sand and gravel, texture grades from coarse sand to fine gravel.....	89.0	90.0
Sand, contains silty clay seams.....	90.0	95.0
Sand and gravel, contains some limonitic stain, contains many feldspars and metamorphics.....	95.0	106.5
Clay, buff to pink.....	106.5	108.5
Sand and gravel, texture grades from medium sand to coarse gravel, contains limestone fragments from 160.0 to 165.0 ft., principally quartz from 200.0 to 206.0 ft.....	108.5	208.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, light purplish gray, gray below 219.0 ft.....	208.0	220.0

Test Hole #73-B-46
(1-2-18cc)
Thayer County

Location: SW corner sec. 18, T. 1 N., R. 2 W., approximately
80 feet north and 7 feet east of southwest corner.

Ground elevation: 1,621.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: unknown

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, clayey, dark brown.....	0.0	1.0
Clay, silty, dark brownish gray.....	1.0	3.0
Silt, clayey, light brownish buff to gray, contains limonitic flecks.....	3.0	10.5
Silt, clayey, soil-like, dark brown.....	10.5	12.5
Clay, silty, dark brownish gray.....	12.5	14.0
Clay, silty, to silt, clayey, light pinkish brown...	14.0	35.0
Silt, clayey to sandy, light pinkish brown, contains fine sand.....	35.0	40.0
Silt, clayey, light brownish tan.....	40.0	55.0
Silt, clayey to sandy, light brownish tan, contains fine sand.....	55.0	65.0
Silt, clayey, light brownish tan, contains limy layers from 104.5 to 108.0 ft.....	65.0	108.0
Clay, sandy, grading to silty sand, light grayish tan, contains limy layer at 109.8 ft.....	108.0	110.0
Sand, silty, texture grades from fine to coarse sand	110.0	112.5
Sand, brownish gray to pink, texture grades from fine to coarse sand with some gravel.....	112.5	130.0
Sand and gravel, light brownish gray to pink, tex- ture grades from fine sand to coarse gravel.....	130.0	223.0
Sand, brownish gray to pink, texture grades from medium to coarse sand with some gravel.....	223.0	239.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Clay shale, light gray.....	239.0	242.0
Clay shale, silty, dark gray, slightly micaceous....	242.0	250.0

Test Hole #34-B-44
(1-2-23cd)
Thayer County

Location: SE corner SW sec. 23, T. 1 N., R. 2 W., approximately
 2,606 feet east and 6 feet north of southwest corner.

Ground elevation: 1,509.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: 51.5 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, silty, light reddish brown, granular from 0.0 to 2.0 ft.....	0.0	15.0
Clay, silty, and some silt, interbedded, gray.....	15.0	39.0
Silt, brownish gray, contains thin limonitic zone at 40.0 ft.....	39.0	41.0
Silt, light gray.....	41.0	45.5
Limestone, reworked, contains shell fragments.....	45.5	48.0
Sand and gravel, texture grades from coarse sand to fine gravel, feldspathic and metamorphic.....	48.0	60.0
Sand, gray, texture grades from fine to medium.....	60.0	66.5
Sand, silty, moderately calcareous, light brownish gray, fine texture sand.....	66.5	80.0
Sand, gray, very fine texture sand, principally quartz with feldspars and a few dark minerals.....	80.0	90.0
Sand, texture grades from fine to coarse.....	90.0	97.0
Clay, silty, moderately calcareous, light brownish gray to tan.....	97.0	101.0
Clay and limestone, gray.....	101.0	110.0
Clay, silty, moderately calcareous, light brownish gray.....	110.0	115.0
Silt, moderately calcareous, gray.....	115.0	133.0
Clay, silty, bluish gray, contains limestone fragments.....	133.0	136.5
Sand and gravel.....	136.5	138.0
Shale, limestone, and shell fragments.....	138.0	139.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Limestone.....	139.5	142.0
Sandstone, very calcareous, greenish gray, well consolidated.....	142.0	144.5
Shale, gray.....	144.5	150.0

Test Hole #67-B-46
(1-4-30cc)
Thayer County

Location: SW corner sec. 30, T. 1 N., R. 4 W., approximately
 77 feet north and 7 feet east of southwest corner.

Ground elevation: 1,660.0 ft. (t) (Byron 7.5 min. quadrangle)

Depth to water: 122.0 ft.

Depth, in feet
 From To

Quaternary System, undifferentiated:

Soil: silt, clayey, dark brown.....	0.0	1.5
Silt, clayey, medium brownish gray.....	1.5	2.5
Silt, clayey, light brownish buff.....	2.5	9.0
Silt, clayey, soil-like, dark brown.....	9.0	12.0
Silt, clayey, to clay, silty, light brown to pink, lighter in lower part.....	12.0	16.0
Clay, silty, light gray with pinkish tint.....	16.0	21.0
Silt, clayey, light pinkish tan.....	21.0	35.0
Silt, clayey, medium brownish tan, less clayey in lower part.....	35.0	45.0
Silt, slightly clayey, brownish tan.....	45.0	49.0
Silt, sandy, light brownish gray with pinkish tint..	49.0	58.0
Sand, light brownish gray, texture grades from fine to coarse sand with some gravel, contains a silt layer at 68.0 ft.....	58.0	70.0
Sand and gravel, brownish gray to red, texture grades from medium sand to coarse gravel.....	70.0	161.0

Cretaceous System - Upper Cretaceous Series - Colorado Group:

Carlile Formation:

Shale, moderately calcareous, dark gray to black, contains some white specks, hard zone from 167.0 to 168.0 ft.....	161.0	180.0
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Test Hole #37-B-44
(2-1-31ab)
Thayer County

Location: NW corner NE sec. 31, T. 2 N., R. 1 W., approximately
 12 feet south and 2,633 feet west of northeast corner.

Ground elevation: 1,568.0 ft. (t) (Hubbell 7.5 min. quadrangle)

Depth to water: unknown

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: black.....	0.0	3.0
Clay, silty, tan to tannish gray.....	3.0	10.0
Clay, silty, dark reddish brown.....	10.0	45.0
Silt, buff to reddish brown.....	45.0	89.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn Formation:		
Limestone and shale, interbedded, contains a weathered zone from 89.5 to 90.5 ft.....	89.5	100.0

Test Hole #36-B-44
(2-1-32cd)
Thayer County

Location: C SL sec. 32, T. 2 N., R. 1 W., approximately 2,640 feet east and 6 feet north of southwest corner.

Ground elevation: 1,510.0 ft. (t) (Hubbell 7.5 min. quadrangle)

Depth to water: 77.2 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Silt, reddish brown.....	0.0	6.0
Silt, reddish brown to tan, contains some embedded gravel below 38.0 ft.....	6.0	40.0
Silt, greenish gray.....	40.0	45.0
Sand, contains feldspars and green metamorphics.....	45.0	50.0
Sand, light greenish gray, texture grades from medium to coarse.....	50.0	55.0
Sand and gravel.....	55.0	59.5
Silt, clayey, light greenish gray.....	59.5	60.5
Clay and sand and gravel, interbedded, sand and gravel consists of green minerals.....	60.5	65.0
Sand and gravel, texture grades from medium sand to coarse gravel, composed principally of feldspar from 65.0 to 80.0 ft., more quartz and metamorphics from 80.0 to 128.0 ft.....	65.0	128.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, very limonitic.....	128.0	129.0
Shale, gray, limonitic from 131.0 to 134.5 ft., dark gray with carbonaceous spots below 139.5 ft..	129.0	140.0

**Test Hole #38-B-44
(2-2-25ba)
Thayer County**

Location: NE corner NW sec. 25, T. 2 N., R. 2 W., approximately
2,602 feet east and 5 feet south of northwest corner.
Ground elevation: 1,574.0 ft. (t) (Hubbell 7.5 min. quadrangle)
Depth to water: 79.4 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, black to reddish brown.....	0.0	2.0
Clay, silty, brownish gray.....	2.0	2.5
Clay, silty, tannish gray.....	2.5	7.0
Silt, light gray.....	7.0	13.0
Clay, silty, dark reddish brown, granular in upper part.....	13.0	18.0
Clay, silty, light reddish brown.....	18.0	20.0
Sand, silty, reddish brown, fine texture sand.....	20.0	35.0
Silt, tan, contains limy zones.....	35.0	87.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Limestone and shale, limonitic and contains a hard limy zone at 89.5 ft., contains a bentonite zone below 95.0 ft.....	87.0	100.0

**Test Hole #77-B-46
(2-3-13aa)
Thayer County**

Location: NE corner sec. 13, T. 2 N., R. 3 W., approximately
133 feet west and 29 feet south of northeast corner.
Ground elevation: 1,520.0 ft. (t) (Hebron 7.5 min. quadrangle)
Depth to water: 49.3 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill.....	0.0	2.5
Soil: clay, silty, dark gray to brown.....	2.5	3.5
Clay, silty, medium brownish gray.....	3.5	4.5
Clay, silty, light reddish brown, contains more silt and a few sand grains in lower part.....	4.5	12.5
Silt, clayey, light reddish brown.....	12.5	23.0
Silt, clayey, soil-like, medium brown.....	23.0	23.5
Silt, clayey to sandy.....	23.5	24.0
Sand and gravel, reddish brown to gray, texture grades from fine sand to coarse gravel with some pebbles.....	24.0	77.5
Silt, clayey, to clay, silty, light grayish tan to brown.....	77.5	80.0
Silt, clayey, medium brownish tan, contains some reworked limestone fragments.....	80.0	84.5
Gravel, consists of reworked limestone and shale fragments.....	84.5	86.3
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn Formation:		
Shale and limestone, interbedded.....	86.3	90.0

**Test Hole #75-B-46
(2-3-25aa)
Thayer County**

Location: NE corner sec. 25, T. 2 N., R. 3 W., approximately
75 feet west and 10 feet south of northeast corner.

Ground elevation: 1,579.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: 88.6 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, clayey, dark brown.....	0.0	2.5
Clay, silty, medium reddish brown.....	2.5	4.5
Clay, silty, light pinkish brown to gray.....	4.5	8.5
Clay, silty, light gray to brown.....	8.5	15.0
Clay, silty, light brownish tan to pink.....	15.0	22.0
Silt, clayey, light brownish tan to pink.....	22.0	30.0
Silt, clayey, light grayish tan, contains some limy nodules and a limy zone from 36.5 to 38.0 ft.....	30.0	40.0
Silt, clayey, light grayish tan to brown.....	40.0	44.5
Silt, very calcareous, grayish white.....	44.5	47.5
Sand, light brownish gray to red, texture grades from fine to coarse sand with some gravel.....	47.5	60.0
Sand and gravel, reddish brown to gray, texture grades from medium sand to medium gravel with some coarse gravel.....	60.0	117.5
Silt, clayey, light gray to brown, contains nodular limy zone at 120.5 and 123.5 ft.....	117.5	127.5
Clay, silty, medium gray with bluish tint.....	127.5	140.0
Silt, clayey, light grayish tan.....	140.0	147.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn - Graneros Formations:		
Limestone, light gray, contains many shell fragments	147.5	149.0
Shale, silty, grayish white, grayish yellow in lower part.....	149.0	160.0

Test Hole #74-B-46**(2-3-36dd)****Thayer County**

Location: SE corner sec. 36, T. 2 N., R. 3 W., approximately
66 feet west and 21 feet north of southeast corner.

Ground elevation: 1,590.0 ft. (t) (Chester 7.5 min. quadrangle)

Depth to water: 70.0 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, clayey, dark brown.....	0.0	1.0
Silt, clayey, to clay, silty, medium brown to gray..	1.0	2.0
Silt, clayey, medium brownish buff.....	2.0	7.5
Silt, clayey, soil-like, dark brown to red.....	7.5	11.0
Clay, silty, light reddish brown, darker in lower part.....	11.0	20.0
Silt, clayey, light brownish tan.....	20.0	40.0
Silt, clayey to sandy, light brownish tan, contains fine sand.....	40.0	45.0
Silt, sandy, light brownish tan to pink.....	45.0	51.0
Sand, silty, brownish gray to pink, texture grades from fine to coarse sand.....	51.0	54.5
Sand and gravel, light reddish brown to gray, tex- ture grades from medium sand to medium gravel.....	54.5	60.0
Sand, light brownish gray to pink, texture grades from fine to coarse.....	60.0	64.0
Silt, sandy, light brownish tan, contains fine sand.	64.0	69.5
Sand, light brownish gray, texture grades from fine to coarse.....	69.5	72.5
Silt, sandy, to sand, silty, light grayish tan.....	72.5	74.0
Sand and gravel, light reddish brown to gray, tex- ture grades from medium sand to coarse gravel.....	74.0	82.5
Silt, clayey, light brownish tan, contains concre- tionary layers from 90.0 to 98.0 ft.....	82.5	98.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Clay shale, chalky, very calcareous, light yellow, contains intermittent hard layers below 100.0 ft..	98.0	105.0
Greenhorn Formation:		
Clay shale, very calcareous, light yellowish gray from 105.0 to 110.0 ft., light gray from 110.0 to 126.0 ft., dark gray speckled white below 126.0 ft.....	105.0	130.0

**Test Hole #40-B-45
(3-1-23bb)
Thayer County**

Location: NW NW NW sec. 23, T. 3 N., R. 1 W., approximately
136 feet south and 16 feet east of northwest corner.

Ground elevation: 1,511.0 ft. (t) (Alexandria 7.5 min. quadrangle)

Depth to water: 61.0 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, dark brown.....	0.0	1.5
Silt, brownish buff, contains a few calcareous nodules, darker and blocky with depth.....	1.5	8.0
Silt, clayey, grayish buff.....	8.0	9.5
Clay, silty, dark brown to red.....	9.5	12.0
Clay, silty, reddish brown.....	12.0	20.0
Clay, sandy, light reddish brown, more sandy in lower part.....	20.0	24.0
Sand and gravel, light brown with reddish tint, texture grades from fine sand to coarse gravel, reddish brown from 30.0 to 70.0 ft., pinkish brown from 70.0 to 82.0 ft.....	24.0	82.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn - Graneros Formations:		
Shale, white with yellowish tint.....	82.0	84.0
Shale, dark gray to black, contains hard light gray limy layers below 87.0 ft.....	84.0	90.0

Test Hole #76-B-46
(3-2-30cc)
Thayer County

Location: SW corner sec. 30, T. 3 N., R. 2 W., approximately
 15 feet north and 90 feet east of southwest corner.
 Ground elevation: 1,569.0 ft. (t) (Hebron 7.5 min. quadrangle)
 Depth to water: 102.9 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: clay, silty, dark brown.....	0.0	1.0
Silt, clayey, medium grayish brown.....	1.0	2.5
Silt, clayey, light grayish buff, darker below 10.0 ft.....	2.5	12.5
Silt, clayey, soil-like, dark brown.....	12.5	14.5
Clay, silty, reddish brown.....	14.5	25.0
Silt, clayey, light brownish tan, grayish tint and contains a few sand grains from 30.0 to 40.0 ft...	25.0	40.0
Sand and gravel, brownish gray to pink, texture grades from fine sand to coarse gravel, silty from 40.0 to 42.0 ft.....	40.0	92.0
Silt, clayey, light yellowish gray.....	92.0	95.0
Sand and gravel, reddish brown to gray, texture grades from medium sand to medium gravel, contains gray clay seam at 105.0 ft.....	95.0	117.8
Silt, clayey, medium brownish tan, contains white nodules.....	117.8	124.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn Formation:		
Shale, silty, light yellow and grayish white.....	124.0	127.7
Limestone, chalky, grayish white to yellow, contains brown limonitic fragments.....	127.7	129.7
Shale and limestone, interbedded, principally lime- stone, contains shell fragments.....	129.7	140.0

Test Hole #78-B-46
(3-3-12dd)
Thayer County

Location: SE SE SE sec. 12, T. 3 N., R. 3 W., approximately
 110 feet west and 10 feet north of southeast corner.

Ground elevation: 1,562.0 ft. (t) (Bruning 7.5 min. quadrangle)

Depth to water: unknown

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, clayey, dark brown.....	0.0	0.5
Clay, silty, medium brownish gray.....	0.5	1.5
Silt, clayey, light brownish buff, slightly darker in lower part.....	1.5	11.0
Silt, clayey, soil-like, brown with reddish tint....	11.0	13.5
Clay, silty, dark reddish brown, light below 15.0 ft.....	13.5	20.0
Silt, clayey, light reddish brown.....	20.0	23.0
Sand, grayish brown to red, texture grades from fine to coarse sand with some fine to medium gravel....	23.0	27.5
Silt, clayey to sandy, grayish tan to light gray....	27.5	29.5
Sand and gravel, reddish brown to gray, texture grades from medium sand to coarse gravel with some pebbles, contains limonitic stain from 70.0 to 90.0 ft.....	29.5	240.0
Sand, light brownish gray to red, texture grades from fine to coarse sand with some gravel, con- tains clay seam at 254.5 ft.....	240.0	292.5
Clay, silty, light grayish tan.....	292.5	296.0
Clay, silty, light gray with bluish tint.....	296.0	303.0
Silt, sand and gravel, brownish white, composed principally of reworked limestone fragments and limonitic and ironstone pellets.....	303.0	307.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Clay shale, silty, slightly calcareous, dark gray to brown, black from 310.0 to 315.0 ft.....	307.5	320.0

**Test Hole #70-B-46
(3-4-7bb)
Thayer County**

Location: NW NW NW sec. 7, T. 3 N., R. 4 W., approximately
265 feet east and 10 feet south of northwest corner.
Ground elevation: 1,618.0 ft. (t) (Ruskin 7.5 min. quadrangle)
Depth to water: 68.2 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Road fill: silt, clayey, dark brown.....	0.0	2.0
Silt, clayey, medium brownish gray and dark brown, contains a trace of sand and gravel.....	2.0	4.5
Clay, silty, light pinkish brown.....	4.5	7.5
Silt, clayey to sandy, medium brown to pink.....	7.5	10.0
Silt, clayey, light grayish brown.....	10.0	18.5
Sand and gravel, pinkish brown to gray, texture grades from medium sand to coarse gravel.....	18.5	62.0
Silt, clayey to sandy, grayish tan to pink.....	62.0	67.0
Sand and gravel, reddish brown to gray, texture grades from medium sand to medium gravel with some coarse gravel.....	67.0	79.0
Silt, clayey, medium brownish gray.....	79.0	81.0
Sand and gravel, reddish brown to gray, texture grades from medium sand to medium gravel with some coarse gravel, contains a few silt layers.....	81.0	96.5
Silt, clayey, light brownish tan.....	96.5	100.0
Silt, clayey to sandy, light pinkish tan.....	100.0	105.0
Silt, clayey, light grayish green.....	105.0	107.0
Sand, brownish gray to pink, texture grades from medium sand to medium gravel.....	107.0	132.5
Silt, clayey, light grayish brown.....	132.5	134.5
Sand and gravel, light brownish gray to pink, tex- ture grades from medium sand to coarse gravel.....	134.5	152.5
Silt, clayey, light brownish tan.....	152.5	158.0
Sand, brownish gray to pink, texture grades from medium to coarse sand with some gravel.....	158.0	166.0
Silt, clayey to sandy, light brownish gray with greenish tint, contains fine sand, contains a small amount of white calcareous silt.....	166.0	172.5
Sand and gravel, brownish gray to pink, texture grades from medium sand to fine gravel with some medium gravel.....	172.5	192.5
Clay, silty, gray with greenish tint.....	192.5	197.5
Sand, light brownish gray, texture grades from fine to medium.....	197.5	210.0
Silt, clayey, dark gray, black at top.....	210.0	215.0
Sand, light brownish gray, texture grades from fine to medium.....	215.0	217.0
Silt, clayey, gray with bluish tint.....	217.0	226.0
Sand, light brownish gray, texture grades from fine to medium.....	226.0	228.0
Silt, clayey, medium gray with bluish tint, con- tains some dark gray clay fragments.....	228.0	233.0

Cretaceous System - Upper Cretaceous Series - Colorado Group:

Carlile Formation:

Clay shale, silty, moderately calcareous, light yellowish gray, contains a hard layer at 236.0 ft.	233.0	243.0
Clay shale, silty, moderately calcareous, black, strong petroliferous odor.....	243.0	247.5
Limestone, shaley, light gray.....	247.5	248.2
Shale, moderately calcareous, black, contains a thin hard layer at 249.8 ft.....	248.2	250.0

Test Hole #72-B-46
(3-4-31cc)
Thayer County

Location: C WL SW sec. 31, T. 3 N., R. 4 W., approximately
 1,320 feet north and 5 feet east of southwest corner.

Ground elevation: 1,659.0 ft. (t) (Ruskin 7.5 min. quadrangle)

Depth to water: 110.6 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, clayey, dark brown.....	0.0	1.5
Silt, clayey, light brownish buff.....	1.5	12.5
Silt, clayey, soil-like, dark brown.....	12.5	14.0
Clay, silty, dark brown.....	14.0	15.0
Clay, silty, to silty, clayey, reddish brown.....	15.0	40.0
Clay, silty, light pinkish tan.....	40.0	47.5
Silt, clayey, light brownish tan to pink.....	47.5	50.0
Silt, clayey, light brownish tan with pinkish tint..	50.0	70.0
Silt, light pinkish tan.....	70.0	77.0
Silt, sandy, light gray to brown.....	77.0	78.5
Silt, clayey to sandy, medium brownish gray.....	78.5	81.0
Sand, light brownish gray to pink, texture grades from fine to coarse sand with some gravel.....	81.0	90.0
Sand and gravel, reddish brown to gray, texture grades from medium sand to coarse gravel, contains a silt seam at 108.5 ft.....	90.0	198.0
Silt, clayey, dark to light gray.....	198.0	207.0
Sand, light brownish gray, texture grades from fine to coarse.....	207.0	208.5
Silt, clayey, light gray.....	208.5	210.0
Sand, light brownish gray, texture grades from fine to coarse.....	210.0	219.0
Silt, clayey, medium gray to blue, contains sand from 227.5 to 228.5 ft.....	219.0	232.0
Sand, light brownish gray, texture grades from fine to coarse sand with some gravel, contains silt from 243.0 to 248.0 ft.....	232.0	248.0
Silt, clayey, to clay, silty, slightly calcareous, dark gray.....	248.0	254.0
Silt and clay, very calcareous, light gray.....	254.0	260.0
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Carlile Formation:		
Shale, white to dark gray.....	260.0	266.5
Shale and limestone, dark gray.....	266.5	270.0

Test Hole #38-B-45
(4-1-14cc)
Thayer County

Location: SW corner sec. 14, T. 4 N., R. 1 W., approximately
 7 feet north and 95 feet east of southwest corner.

Ground elevation: 1,528.0 ft. (t) (Tobias SW 7.5 min. quadrangle)

Depth to water: 107.0 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Soil: clay, black.....	0.0	2.5
Clay, silty, brownish gray.....	2.5	3.5
Silt, light brownish buff to light gray.....	3.5	13.0
Clay, silty, soil-like, dark brown.....	13.0	15.0
Clay, silty, brownish gray.....	15.0	17.0
Clay, sandy, light reddish brown, contains embedded gravel grains, more sandy in lower part.....	17.0	32.0
Sand and gravel, pinkish brown to gray, texture grades from medium sand to coarse gravel.....	32.0	39.0
Clay, silty, light gray to green.....	39.0	40.0
Silt, sandy, and sand, silty, light gray to green and brown.....	40.0	46.0
Sand and gravel, pinkish brown to gray, texture grades from medium sand to coarse gravel, contains a few clay balls and clay seams from 60.0 to 65.0 ft.....	46.0	133.0
Silt, sandy, and clay, yellowish brown, contains limonitic stain.....	133.0	136.0
Sand and gravel, pinkish brown to gray, texture grades from fine sand to coarse gravel.....	136.0	207.0
Silt, sandy, light gray with greenish tint.....	207.0	209.5
Sand, light brownish gray with some pink grains, texture grades from fine to coarse sand with some gravel, contains some gray silt from 230.0 to 233.0 ft.....	209.5	253.0
Silt and sand, grayish black, fine texture sand.....	253.0	256.0
Silt, light bluish gray, contains sand seams.....	256.0	265.0
Clay, silty, medium bluish gray.....	265.0	270.0
Silt, clayey to sandy, medium gray to blue, contains shell fragments.....	270.0	285.0
Silt, sandy, medium gray, very sandy in lower part..	285.0	290.0
Sand, silty, light grayish brown.....	290.0	293.0
Sand and gravel, grayish brown, contains some limon- itic material and shell fragments.....	293.0	300.0
Sand and gravel, composed of reworked shale and limestone fragments.....	300.0	310.0
Silt, sandy, light gray to brown.....	310.0	315.0
Silt, light gray to brown.....	315.0	322.5
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, sandy, grayish white, contains intermittent hard layers.....	322.5	330.0

Test Hole #39-B-45
(4-1-34dd)
Thayer County

Location: SE SE SE sec. 34, T. 4 N., R. 1 W., approximately
 101 feet west and 6 feet north of southeast corner.

Ground elevation: 1,457.0 ft. (t) (Tobias SW 7.5 min. quadrangle)

Depth to water: 12.2 ft.

	Depth, in feet	
	From	To
Quaternary System, undifferentiated:		
Soil: silt, brown.....	0.0	1.0
Silt, dark brown, contains embedded gravel.....	1.0	2.5
Clay, silty, black, contains embedded sand and gravel grains below 4.0 ft.....	2.5	6.0
Sand and gravel, pinkish gray, texture grades from fine sand to coarse gravel.....	6.0	19.0
Silt, light gray.....	19.0	21.0
Sand and gravel, light brownish gray with some pink grains, texture grades from fine sand to coarse gravel.....	21.0	28.0
Clay, silty, black, carbonaceous.....	28.0	32.0
Clay, silty, light gray to light brown.....	32.0	35.0
Sand and gravel, light brownish gray with some pink grains, texture grades from fine sand to coarse gravel.....	35.0	40.5
Silt, sandy, light brownish gray, contains fine sand	40.5	46.0
Sand and gravel, brownish gray with some pink grains, texture grades from medium sand to coarse gravel, contains a silt seam at 108.0 ft., con- tains carbonaceous material below 115.0 ft.....	46.0	118.0
Clay, silty, light gray to green.....	118.0	120.0
Sand and gravel, light brownish gray with some pink grains, texture grades from medium sand to coarse gravel.....	120.0	157.0
Silt, sandy, brownish to medium gray.....	157.0	164.0
Sand and gravel, light brownish gray with some pink grains, texture grades from medium sand to coarse gravel.....	164.0	266.0
Clay, silty, dark brownish gray.....	266.0	270.0
Silt, clayey to sandy, light gray, contains fine sand.....	270.0	293.0
Sand and gravel, brownish gray with some pink grains, texture grades from fine sand to coarse gravel, brown and contains many limonitic frag- ments below 300.0 ft.....	293.0	305.0
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Shale, light gray to reddish purple.....	305.0	310.0

Test Hole #80-B-46
(4-2-7cc)
Thayer County

Location: SW corner sec. 7, T. 4 N., R. 2 W., approximately
 98 feet north and 6 feet east of southwest corner.

Ground elevation: 1,588.0 ft. (t) (Bruning 7.5 min. quadrangle)

Depth to water: 66.8 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, dark gray, brownish tint below 1.5 ft.....	0.0	2.5
Silt, clayey, medium brownish buff, grayish tint in lower part.....	2.5	12.0
Clay, silty, light gray with brown stains.....	12.0	14.0
Clay, silty, dark grayish brown, granular in lower part.....	14.0	16.0
Clay, silty, medium grayish brown with pinkish tint.	16.0	17.0
Clay, light pinkish brown.....	17.0	20.0
Clay, silty to sandy, light pinkish brown, more sandy and gray in lower part, contains fine sand..	20.0	30.0
Sand, silty, light gray to light brown.....	30.0	35.0
Sand and gravel, brownish gray to pink, texture grades from fine sand to coarse gravel.....	35.0	124.0
Silt, in part clayey, light yellowish gray to green.	124.0	125.0
Silt, clayey, light gray.....	125.0	128.5
Silt, clayey, light grayish tan, contains a few calcareous nodules.....	128.5	157.0
Silt, clayey, medium gray to brown, contains a few hard white limy zones from 158.0 to 159.3 ft.....	157.0	161.0
Clay, silty, medium gray to brown.....	161.0	165.0
Clay, silty, light brownish tan to gray.....	165.0	170.0
Silt, clayey, medium gray to blue, contains some dark gray silty clay in lower part.....	170.0	180.0
Clay, silty, slightly calcareous, medium gray with bluish tint.....	180.0	194.0
Clay, silty, light brownish tan.....	194.0	200.0
Clay, silty, light yellowish tan.....	200.0	202.5
Cretaceous System - Upper Cretaceous Series - Colorado Group:		
Greenhorn Formation:		
Limestone and shale, light yellow.....	202.5	210.0

Test Hole #79-B-46**(4-3-25dd)****Thayer County**

Location: SE corner sec. 25, T. 4 N., R. 3 W., approximately
61 feet west and 8 feet north of southeast corner.

Ground elevation: 1,574.0 ft. (t) (Bruning 7.5 min. quadrangle)

Depth to water: 77.2 ft.

	<u>Depth, in feet</u>	
	From	To
Quaternary System, undifferentiated:		
Clay, medium brown to gray.....	0.0	0.5
Clay, silty, medium brownish gray.....	0.5	2.0
Silt, clayey, light brownish buff with grayish tint, slightly darker below 10.0 ft.....	2.0	11.5
Silt, clayey, soil-like, dark brown.....	11.5	15.0
Clay, silty, reddish brown.....	15.0	23.0
Silt, clayey to sandy, light reddish brown, contains some fine to coarse sand.....	23.0	26.0
Silt, sandy, light brownish tan to pink, contains some gravel.....	26.0	35.5
Sand and gravel, reddish brown to gray, texture grades from fine sand to fine gravel with some coarse gravel.....	35.5	48.0
Silt, sandy and clayey, light gray with some limon- itic stain.....	48.0	51.0
Sand and gravel, light brownish gray to red, texture grades from medium sand to coarse gravel.....	51.0	93.0
Silt, clayey, to clay, silty, light brownish tan to pink.....	93.0	106.0
Sand, light brownish gray with pinkish tint, texture grades from fine to coarse sand with some gravel, contains silt from 106.0 to 108.0 ft.....	106.0	119.0
Sand and silt, interbedded, light gray to brown, texture grades from fine to coarse sand with some gravel.....	119.0	130.5
Sand, brownish gray to red, texture grades from fine to coarse sand with some gravel, contains a silt seam at 134.5 ft.....	130.5	142.5
Silt, clayey to sandy, light brownish gray, contains fine sand.....	142.5	145.0
Sand, light brownish gray to red, texture grades from fine to coarse sand with some gravel, con- tains a silt seam at 147.8 ft.....	145.0	184.0
Sand and gravel, brownish gray to red, texture grades from medium sand to medium gravel, contains a sandy layer at 222.3 ft.....	184.0	230.0
Sand, silty, light green to yellow, fine texture sand, micaceous.....	230.0	233.0
Sand and gravel, brownish gray to red, texture grades from medium sand to coarse gravel.....	233.0	280.1
Cretaceous System - Lower Cretaceous Series - Dakota Group:		
Clay shale, silty, light gray, in part yellow.....	280.1	282.0
Shale, silty, light gray, contains some dark specks and brown ironstone concretions in lower part.....	282.0	288.0
Shale, fine gravel, and sandstone, contains limonite and ironstone seams.....	288.0	292.0

Shale, light grayish white and yellow, contains many limonitic seams.....	292.0	297.5
Shale, silty, medium gray.....	297.5	300.0